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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/546,227	04/10/2000	Kazuhiko Koike	PM268032	2762

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EXAMINER
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JOHNSON, EDWARD M

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 04/04/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/546,227

Applicant(s)

KOIKE ET AL.

Examiner

Edward M. Johnson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 February 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 73-78, 80-99, 102 and 103 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 73-78, 80-99, 102 and 103 is/are rejected.
- 7) ☒ Claim(s) 87 and 88 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8, 10.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Information Disclosure Statement***

1. The information disclosure statement filed 1/2/02 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. No copies of the two PCT references were found in the file and therefore were canceled on the Form-1449 and not considered. The other references were considered as indicated on the Form.

***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 250 words. It is important that the abstract not exceed 250 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the term, "vacanies" in line 5 appears incorrect. Examiner suggests --vacancies--. Correction is required. See MPEP § 608.01(b).

***Claim Objections***

4. Claims 87-88 are objected to because of the following informalities: claims 87-88, "as a component of a cordierite composition" appears grammatically incorrect. Examiner suggests deletion of "at least as a main component of". The phrase, "an Si source" appears incorrect. Examiner suggests --a Si source--. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 75, 80, 83-97, 99, and 102-103 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 75, "said average distance" and "said crystal component" lack antecedent basis.

Claims 80, 83-85, and 94-97 appear to contain improper Markush groups. Examiner suggests using the language --selected

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from the group consisting of-- and linking the members with -- and--.

Claims 87-88, the phrase "comprising at least as a main component of" appears grammatically incorrect and is unclear as to whether open or closed language is intended. Examiner suggests --comprising--, --consisting of--, or --consisting essentially of--.

Claim 99, "the same or different compositions" lacks antecedent basis.

Regarding claims 102-103, the term "theoretical" renders the claim indefinite because it is unclear whether the limitation(s) following the term are part of the claimed invention or merely theoretical. See MPEP § 2173.05.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 73 is rejected under 35 U.S.C. 102(b) as anticipated by Ichii et al. 5,607,885.

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Regarding claim 73, Ichii '885 discloses a catalyst and honeycomb catalyst carrier (see column 1, lines 17-19), without coating the carrier (see Examples 1-5).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 74-76 and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichii '885.

Regarding claims 74-76 and 97 Ichii '885 discloses a metal composition of more than 48% by weight (see column 5, lines 29-30).

Ichii fails to disclose the distance between the catalyst particles, but discloses crystal diameters smaller than 3 microns.

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made that the particles would be separated by less than 3 microns because Ichii discloses crystal diameters of less than 3 microns

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(see column 10, lines 1-2 and 45-47), which support catalyst particles. Thus, one skilled in the art would reasonably expect the average distance between the particles to be less than three microns, and more particularly 0.1-100 nm, and the desirability of distributing particles by a distance less than the crystal diameter over the surface of the crystal, rather than all in the same area, to increase exposure would have been obvious to one of ordinary skill at the time the invention was made.

Regarding claim 97, Ichii discloses mixing and pouring, both of which would cause vibration in a liquid.

11. Claims 77-93, and 102-103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichii '885 as applied to claims 73 and 76 above, and further in view of Beauseigneur et al. 5,346,722.

Regarding claims 77-93, Ichii '885 discloses cordierite honeycomb (see column 3, lines 43-47) with a lattice defect with oxygen vacancies and oxygen storing capability (see column 1, lines 63-66; the term "capability" indicating oxygen may or may not be stored), a composition of more than 48% by weight (see column 5, lines 29-30), and a honeycomb catalyst carrier without a coating (see column 1, lines 17-19), heating to form microcracks, and reheating (see column 4, lines 60-67).

Ichii '885 fails to specifically disclose ceria, catalytic metals, and pore size of 100 nm or less.

Beauseigneur '722 discloses ceria (see abstract), transition metals (see column 6, line 29 and column 7, lines 65-68), and pore size of less than 5 microns (see column 3, lines 67-68).

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the pore diameter, ceria, and metals of Beauseigneur in the honeycomb cordierite of Sato because Beauseigneur discloses his ceria as particularly preferred (see column 6, lines 54-55), in a method of improving thermal shock resistance (title), in a honeycomb cordierite (see column 1, lines 5-24), to support catalyst metals for use as catalyst (see column 7, lines 65-68).

Regarding claims 77-93, Beauseigneur '722 discloses pore diameter less than 5 microns (see column 3, lines 67-68) and catalyst metals (see column 7, lines 65-68), including noble metals (see column 8, lines 65-66).

Regarding claim 77, it is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Pt as a catalyst metal in view of Applicant's admission that such catalysts are "widely used" and



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"conventional" (see specification, page 1, second full paragraph).

Regarding claim 78, it is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pores of 0-50 microns because Ichii discloses microcracks on particles of 50 microns, which disappear (see abstract and column 8, lines 52-55).

Regarding claims 102-103, Ichii discloses  $2\text{MgO} \cdot 2\text{AlO}_3 \cdot 5\text{SiO}_2$  (see column 5, line 29).

12. Claims 94, 96, and 98-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichii '885 as applied to claim 73 above, and further in view of Knapton et al. 4,189,405.

Regarding claim 94, Ichii fails to disclose CVD or PVD.

Knapton '405 discloses chemical vapour deposition (see column 5, lines 11-19).

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the CVD of Knapton in the catalyst of Ichii because Knapton discloses the CVD in an intermetallic catalyst (title) to form an alumina layer on alloys which do not contain sufficient aluminum to form their own alumina layer (see column 5, lines

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11-14) and to give the requisite compound (see column 2, lines 48-51).

Regarding claim 96, Knapton discloses water or an organic solvent, which would obviously, to one of ordinary skill, include organic solvents that have a higher surface tension than water.

Regarding claims 98-99, Knapton discloses impregnation by heating a mixture of chemicals to produce the catalyst (see column 2, lines 40-47).

13. Claim 95 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichii '885 as applied to claim 73 above, and further in view of Abe et al. 5,489,865.

Regarding claim 95, Ichii fails to disclose supercritical conditions.

Regarding claim 95, Abe '865 discloses drying gel under supercritical condition (see column 3, lines 48-50).

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the supercritical conditions of Abe in the process of Ichii because Abe discloses the supercritical conditions in a catalyst process (title) to obtain a noble metal-dispersed alumina precursor sol or gel (see column 3, lines 47-48).

**Response to Arguments**

Applicant's arguments filed 2/21/02 have been fully considered but they are not persuasive.

It is argued that the Office Action asserts that Ichii discloses "a honeycomb catalyst carrier without a coating", applicant submits that this assertion is in error. This is not persuasive because Ichii does not disclose a coating. Applicant appears to suggest that since coatings are disclosed in the two submitted technical papers, the catalyst of Ichii is inherently coated. However, Applicant does not appear to offer any evidence supporting such a link between the submitted technical papers and the cited prior art to support the assertion that such a coating would be "inherent" on all catalysts "for the purpose stated... in Ichii". Rather, it appears more plausible that coatings are disclosed in the submitted papers, and not in Ichii, because the catalyst of Ichii does not contain, inherently or otherwise, the coatings of Applicant's submitted technical papers.

It is argued that claim 74 depends from claim 73 and further specifies that the average distance between particles of the catalyst component. This is not persuasive because it would have been obvious to one of ordinary skill in the art at the time the invention was made separate the particles by 0.1-100 nm because Ichii discloses crystal diameters of less than 50

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microns and the desirability of distributing particles by a distance less than the crystal diameter over the surface of the crystal, rather than all in the same area, to increase exposure would have been obvious to one of ordinary skill at the time the invention was made.

It is argued that claim 75 depends from claim 74. This is not persuasive because it would have been obvious to one of ordinary skill in the art at the time the invention was made separate the particles by 0.1-100 nm because Ichii discloses crystal diameters of less than 50 microns and the desirability of distributing particles by a distance less than the crystal diameter over the surface of the crystal, rather than all in the same area, to increase exposure would have been obvious to one of ordinary skill at the time the invention was made in view of the suggestions of the prior art regarding the size of the support particle itself. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It is argued that claim 78 depends from claim 73. This is not persuasive for the reasons above and because it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ microcracks in the surface of a substrate in a manner analogous to pores, which are also depressions in the surface.

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It is argued that by contrast, a portion of the crystal constituting a ceramic body of the present invention is replaced by a noble metal. This is not persuasive because Beauseigneur is not relied upon for both the noble metal and the ceramic body, as Applicant appears to suggest. That rejection is based on a combination of the references. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Further, it would have been obvious to one of ordinary skill at the time the invention was made that when the noble metal is supported on the alumina, the noble metal would replace the catalytic effect of the alumina at least in the area of support.

It is argued that claim 84 depends from claim 80. This is not persuasive because Applicant appears to admit that Ichii discloses vacancies and defects in the starting material, which itself would obviously, to one of ordinary skill, suggest that they may be present in the product. Ichii discloses a lattice defect with oxygen vacancies and oxygen storing capability (see column 1, lines 63-66) and the term "capability" would obviously, to one of ordinary skill, suggest that oxygen may or may not be stored and therefore an oxygen defect may be present.

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It is argued that as discussed above in connection with claim 80. This is not persuasive because Beauseigneur is not relied upon for both the noble metal and the ceramic body, as Applicant appears to suggest. That rejection is based on a combination of the references. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It is argued that with regard to claims 92 and 93, Ichii and Beauseigneur fail to disclose a shock wave. This is not persuasive because Ichii discloses a thermal shock (see column 2, lines 31-33), as noted in the previous Office Action.

#### **Conclusion**

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action

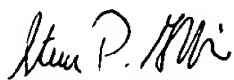
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is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward M. Johnson whose telephone number is 703-305-0216. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven P. Griffin can be reached on 703-308-1164. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
STEVEN P. GRIFFIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

EMJ  
April 1, 2002